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STOPPING WATER POLLUTION AT ITS SOURCE



MISA

Municipal/Industrial Strategy for Abatement

STORM WATER CONTROL

STUDY PROTOCOL



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**STORM WATER CONTROL
STUDY PROTOCOL**

Report prepared by:

Water Resources Branch
Ontario Ministry of the Environment



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FOREWORD

This document constitutes a protocol for conducting a Storm Water Control Study in accordance with the requirements of the "Effluent Limits Regulations" issued under the provisions of Ontario Environmental Protection Act.

The protocol outlines the role and responsibilities of the discharger, the study exemption criteria, and the requirements for conducting a study and developing a control program.

The requirement to conduct a Storm Water Control Study as prescribed by the Effluent Limits Regulations applies only to direct dischargers listed in schedule 1 of the Regulations.

I. INTRODUCTION

As part of the strategy to meet the MISA goal of the "virtual elimination" of persistent toxic contaminants from all discharges into Ontario waterways, control of storm water effluents from industrial sites is required. The goal of storm water control is to reduce contaminant loadings to the maximum extent practicable and to ensure that storm water discharges are non-acutely lethal.

For the purposes of this document, storm water is defined as storm water runoff, snow melt, surface runoff and drainage from a plant site. Storm water discharges associated with industrial activity include but are not limited to discharges from drainage areas, drainage ponds, material handling sites, and raw material storage sites.

Most storm water drainage systems direct storm water and surface drainage towards natural receiving waters. While adequate for property protection and safety concerns, these practices could degrade the quality of receiving waters and result in reduction or loss of water uses.

Storm water discharges were monitored for all sectors, under the MISA Monitoring Regulations. In addition, information on site drainage was collected as part of an initial report submitted by each discharger. Through this work, the Ministry was able to obtain preliminary information on the potential loadings of storm water contaminants to the environment.

The Effluent Limits Regulations do not set limits for storm water discharges. A direct discharger is required instead, to conduct a **Storm Water Control Study (SWCS)**. Under the study, the direct discharger will:

- determine the quantity and quality of storm water discharges;
- identify all sources of storm water contamination (if any);
- identify the need for controls based on the nature of the problem(s);
- evaluate prevention and control measures; and
- develop a **Storm Water Control Program (SWCP)** which identifies preferred prevention and control measures.

This document outlines the steps that a discharger must follow when conducting a SWCS, and applies to those dischargers listed in schedule 1 of the Regulation.

A discharger is relieved of the obligation to conduct a SWCS if the discharger's plant meets the exemption criteria set out in this protocol.

Under the Effluent Limits Regulations, a discharger is not required to submit the results of a SWCS to the Ministry for approval, nor to implement a **Storm Water Control Program (SWCP)**. The discharger must, however, keep the SWCS information required by this protocol on file, and make the information available to the Ministry upon request.

Subsequently, a discharger may be required by the Ministry to implement all or part of a SWCP resulting from the study.

Notwithstanding the above, the Ministry urges all affected dischargers to implement resulting SWCPs on a voluntary basis, as expeditiously as possible, as a contribution towards a cleaner environment.

Implementation of a SWCP may result in the construction of sewage works, which will require the discharger to make an application for approval under the Ontario Water Resources Act. This Act defines "sewage works" to include storm sewers and storm water control facilities.

II. ROLE OF THE DISCHARGER

Unless exempt, it is the responsibility of a discharger to:

- comply with the requirements of the sector Effluent Limits Regulation by carrying out a SWCS within four years of the date on which the Regulation comes into force;
- ensure that all requirements outlined in this protocol document are followed; and,
- prepare the information required by this protocol, keep it on file, and make it available to the Ministry upon request.

It is recommended that a discharger contact the appropriate municipality, Conservation Authority, or office of the Ministry of Natural Resources to determine if a watershed management plan is in place and, if so, whether the plan should be considered during the development of a SWCS.

Where a discharger meets the exemption criteria set out in this protocol, and is thereby relieved of the obligation to conduct a SWCS, the discharger must inform the "Director" accordingly.

III. EXEMPTION CRITERIA

Direct dischargers are exempted from the requirement to conduct a SWCS provided that the following criteria are met:

- Storm water is, prior to discharge, directed to a sewage works for which a Certificate of Approval has been issued by the Ministry under the Ontario Water Resources Act;
- Storm water discharges mix with site process effluent and are subsequently treated by facilities used for the treatment of process effluents;
- The physical characteristics of the operation do not warrant a study because the process areas are totally controlled with no potential for contaminating storm water, run-off or drainage; or,
- A study that meets the requirements of this protocol, has been completed within the last 5 years, and no changes impacting storm water have been made to the plant since the completion of the study.

A discharger exempt from the requirement to conduct a SWCS, shall prepare the following information and make the information available to the Ministry upon request:

- A schematic showing plant layout and collection systems for storm water;
- A summary of MISA monitoring and other data that compares the contaminants found in storm water effluent to the contaminants found in process effluent;
- Documentation of measured storm water volumes relative to volumes of other plant discharges;
- A summary of site practices for the management and/or treatment of storm waters, run-off or drainage waters with accompanying monitoring data; and,
- Plans for corporate long-term monitoring of site management systems for storm waters, run-off or drainage waters.

IV. STORM WATER CONTROL STUDY REQUIREMENTS

The content of SWCSSs will vary with the plant site. As a minimum, to ensure that all areas of potential concern have been adequately covered, a direct discharger's SWCS report shall contain the following documented information:

Background Information

1. A site map showing the outline of drainage areas served by each storm water outfall, process outfall, and once-through cooling water outfall.
2. An estimate of the total area drained by each outfall, as well as the total area of impervious surfaces on the site, including paved areas and building roofs.
3. The frequency of storm water related surges or by-pass events.
4. The volume of storm water discharged during representative storm events. (Document the storm water computer models, calculation procedures, and the type of flow measurement devices or methods used.)
5. Identification of all potential sources and types of storm water contamination.
6. A description of significant materials that are currently being, or have been in the past, treated, stored or disposed of in a manner which may have caused storm water contamination.
7. A description of the existing control measures that are used to reduce contaminants in storm water discharges.
8. A description of the existing treatment processes for storm water discharges including the ultimate disposal routes of any solid or liquid wastes other than by discharge. The description should include:
 - a. analyses of treated storm water quality, including a description of sampling schedules, and sampling and analytical procedures used,
 - b. the location and capacity of inputs, by-passes, treatment, retention, equalization, and recycling operations.
9. Identification of all outfalls discharging untreated storm water that contain process discharges.

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10. Quantitative monitoring data based on samples collected during representative storm events, for the same parameters as those listed in schedule 2 (for the discharger's plant) of the Effluent Limits Regulation for the sector.

NOTE: Samples must be collected from storm water outlets characteristic of the different plant areas (ie. process, parking lots, storage, and loading and unloading of any raw material, intermediate products, finished products, byproduct or waste product) to define the contaminants found in storm water. Usually, a minimum of six to eight flow proportionate composite samples, plus samples for Quality Assurance/Quality Control (QA/QC), are required to determine the relationship of water quality to drainage area and runoff characteristics.

Storm Water Impact Information

1. Information on the loadings for storm water effluents in relation to the loadings for process effluents, for the same parameters as those listed in schedule 2 (for the discharger's plant) of the Effluent Limits Regulation for the sector.
2. Information on the acute lethality testing of storm water effluents discharged from the plant site.

Prevention and Control Information

1. An evaluation of prevention alternatives, that considers, as a minimum, the following control strategies to:
 - a. Intercept storm water in and around areas of storage, loading and unloading of any raw material, intermediate products, finished products, by-product or waste product;
 - b. Minimize the accumulation and/or deposition of debris;
 - c. Regulate the discharge from roofs or other catchment areas;
 - d. Control through the separation of interconnected collection systems;
 - e. Incorporate reuse/recycle of storm water for industrial purposes;
 - f. Promote good housekeeping (i.e. spill cleanup), and employee training and education.

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2. An evaluation of control alternatives, that considers, as a minimum, the following measures:
 - b. Oil/grit separation;
 - c. Sedimentation;
 - d. Storm water retention (sized for at least a 24 hour retention period during the runoff produced by 25 millimetres of rainfall in 6 hours);
 - e. Biological treatment;
 - f. Screening;
 - g. Spill control;
 - h. Infiltration; and,
 - i. Decontamination of soils, waste materials, etc.

Storm Water Control Program (SWCP) Information

A program that will control storm water effluents using preferred alternative prevention and control measures shall be developed as part of the SWCS. A description of the control program shall include the following:

1. Methods of achieving storm water control, including the effectiveness of alternative prevention and control measures, and the preferred measures;
2. Project schedules and costs;
3. Long-term storm water monitoring plans;
4. Relationship of control program to existing contingency plans.

Supplementary Information

1. Flow device calibration information.
2. QA/QC analysis of the storm water monitoring data.
3. A description of any methods used to develop information for the SWCS, such as:
 - storm water computer models
 - fluorometric dye studies
 - flow measurement

STEPS FOR CONDUCTING A STORM WATER CONTROL STUDY



